

Automated Demand Response for Title 24 (2013)

April 27, 2011

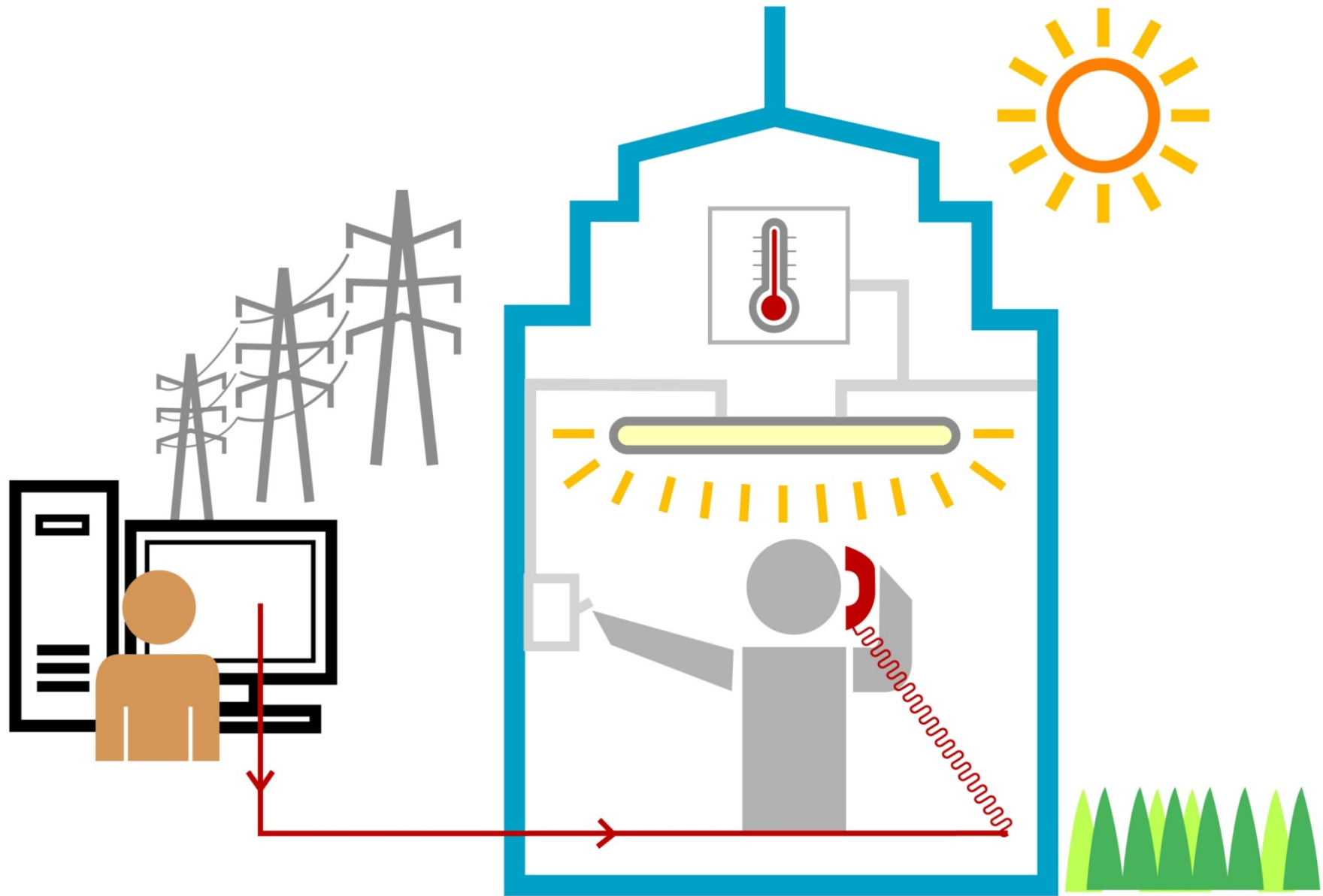
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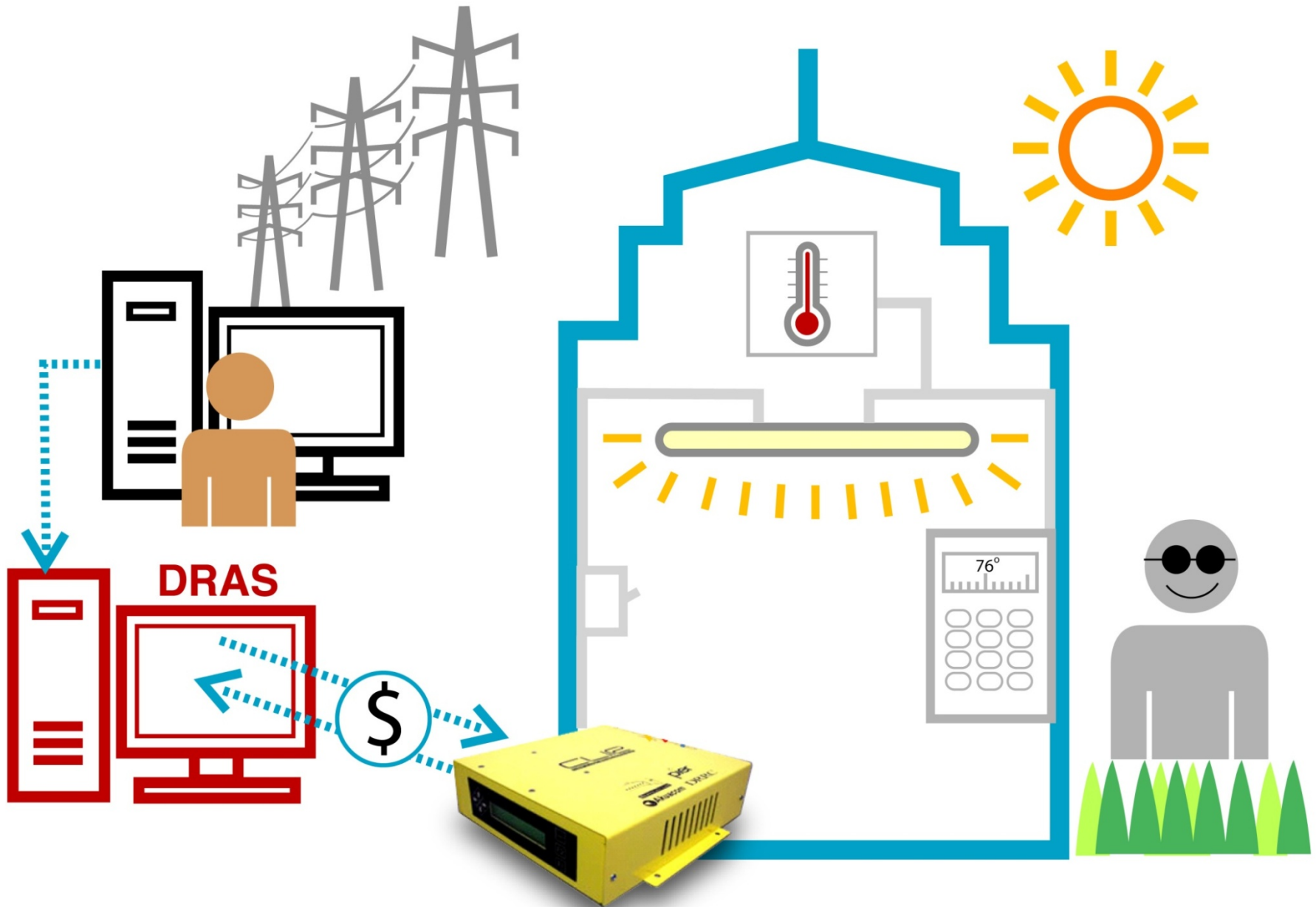
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Manual Electric Load Reduction

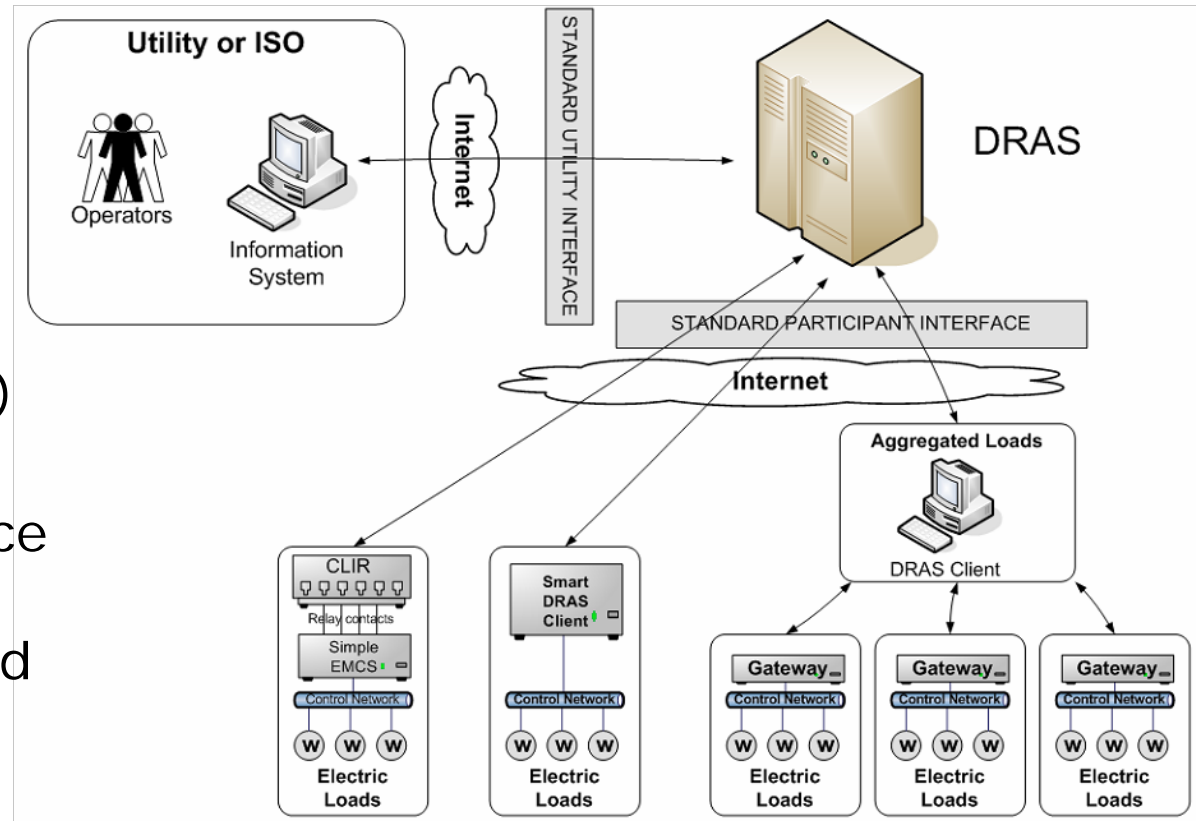


Automated Electric Load Reduction



Demand Response Automation Architecture

1. Utility/ISO defines price* schedule
2. Price published on XML server (DRAS)
3. Clients request price from server every minute & send shed commands
4. EMCS carries out shed



* or other "instruments"

Value of National AutoDR Standards

1. Through the use of nationally recognized open communication standards, the value of installed AutoDR infrastructure [persists over time](#).
2. Without open standards at the facility level, risk of vendor “lock-in” which reduces value of AutoDR investment.
3. Though national open standards may change or be enhanced over time, the open development process ensures that solutions are available from many vendors and that a low-cost or no-cost upgrade path is available to [keep the building stock up to date with the latest software patches](#).



Products using open AutoDR Standards are available today

1. ~ 50 companies have integrated AutoDR client software into their products.
 1. Automated Logic Corp., Honeywell, Echelon, Cisco, Tridium and many mid-sized and smaller manufacturers of controls and communications equipment
2. Hardware retrofit solutions
 1. Device receives signal via Internet, triggers relay contacts.
 2. Existing EMCS initiates demand shed strategies.
3. Software solutions
 1. EMCS receives signal via Internet, triggers software points
 2. Existing EMCS initiates demand shed strategies.



Proposed Code Language 101 (b)

Section 101(b) Definitions

DEMAND RESPONSE is short-term changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

DEMAND RESPONSE PERIOD is a period of time during which electricity loads are curtailed in response to a demand response signal.

DEMAND RESPONSE SIGNAL is a signal sent by the local utility, Independent System Operator (ISO), or designated curtailment service provider or aggregator indicating a price or a request to their customers to curtail electricity consumption for a limited time period.

DEMAND RESPONSIVE CONTROL is a control that is capable of receiving and automatically responding to a demand response signal sent via a third-party network or device



Proposed Code Language 101 (b)

Section 101(b) Definitions (continued)

ENERGY MANAGEMENT CONTROL SYSTEM (EMCS) is often a computerized control system designed to regulate the energy consumption of a building by controlling the operation of energy consuming systems, such as the heating, ventilation and air conditioning (HVAC), lighting and water heating systems. The EMCS is also capable of monitoring environmental and system loads, and adjusting HVAC operations in order to optimize energy usage and respond to demand response signals. (See “**DEMAND RESPONSE SIGNAL**”)

NIST FRAMEWORK AND ROADMAP FOR SMART GRID INTEROPERABILITY STANDARDS is NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 1.0 January 2010



Proposed Code Language 122 (h)

SECTION 122 – REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS

(h) Automatic Demand Shed Controls. HVAC systems with DDC to the Zone level shall be programmed to allow centralized demand shed for non-critical zones as follows:

1. The controls shall have a capability to remotely setup the operating cooling temperature set points by 4 degrees or more in all non-critical zones on signal from a centralized contact or software point within an Energy Management Control System (EMCS).
2. The controls shall have a capability to remotely setdown the operating heating temperature set points by 4 degrees or more in all non critical zones on signal from a centralized contact or software point within an EMCS.
3. The controls shall have capabilities to remotely reset the temperatures in all non critical zones to original operating levels on signal from a centralized contact or software point within an EMCS.
4. The controls shall be programmed to provide an adjustable rate of change for the temperature setup and reset.

5. . The Automatic shed controls shall be capable of the following modes:

i) “Disabled” by authorized facility operators.

ii) “Manual control” by authorized facility operators. Allows operators to adjust heating and cooling setpoints globally throughout the facility from a single point in the EMCS.

iii) “Automatic Demand Shed Control”. Upon receipt of a remote DEMAND RESPONSE SIGNAL, the space conditioning-systems shall conduct a centralized demand shed for non-critical zones during the DEMAND RESPONSE PERIOD, as described in 122 (h) 1. and 122 (h) 2. above.



Proposed Code Language 135

(proposed) SECTION 135

DEMAND RESPONSE SIGNAL. Demand response signals shall conform to a communications standard from Table 4-1 in NIST Framework and Roadmap for Smart Grid Interoperability Standards.



Proposed Code Language

(future compliance manual)

Future compliance manual language:

Acceptable standards include OpenADR (Open Automated Demand Response) and ZigBee Smart Energy Profile.

OpenADR is defined by the following standards development organization:

Organization for the Advancement of Structured Information Standards (OASIS), Energy Interoperation Technical Committee.

http://www.oasis-open.org/committees/workgroup.php?wg_abbrev=energyinterop

ZigBee Smart Energy Profile is defined by the following industry alliance:

<http://www.zigbee.org/Standards/ZigBeeSmartEnergy/Overview.aspx>



THANK YOU!

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Utilities, Aggregators, and ISOs



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Industrial



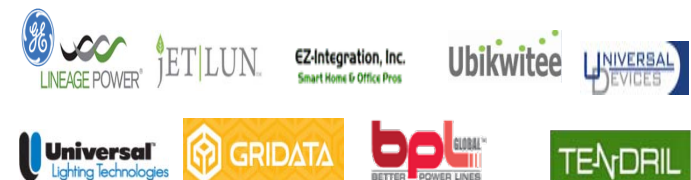
Commercial & Industrial



Commercial



Small Commercial and Residential



OpenADR Pilots & Projects Around the World

